

## 'On Demand' Hot Water Recirculator Guide

The shower is the third biggest water guzzler inside the typical home, and a good portion of it is wasted before you even get in. For a hot shower, you first have to displace the water that's gone cold in the pipe — between one and five gallons — which heads straight down the drain.

In fact, about 25 of the 69 gallons the typical American uses indoors are hot water, and they have to wait 30 seconds to 2 minutes for the tap to heat up. That wait is long enough for the typical person to get distracted, leading them to wait double the necessary time before using their hot water.

These wasted gallons add up. A study by the Department of Energy estimates that a household of four with four hot water fixtures saves 3,600 to 12,000 gallons a year if they install an 'on demand' recirculation system.

### How does it work?

After you push a button or activate the motion sensor, while you are preparing to shower, your 'on demand' system will swiftly and briefly pull hot water from the water heater to your fixture. Hot water is not pulled very far into your cold water line, so you will rarely encounter warm water when you want cold water at the tap. There will only be two seconds of warm (66°F) water in your cold line.



### 'On demand' hot water recirculators work by:

- Using your cold water line as the return loop to the water heater via a connection retrofit,
- Using the existing hot water return line if your home has one, or
- Requiring the installation of a hot water return line.

As you can see, not all 'on demand' recirculation systems are built the same. In addition, some place the pump under the sink at the farthest fixture, while some place it by the water heater. Some motion sensor systems have a minimum threshold for weight or height so that your pet won't set off your hot water pump.

### What Is an 'On Demand' Hot Water Recirculator?

An 'on demand' recirculator, or recirculation system, is activated as needed by you or your family members, to pull hot water from the water heater while simultaneously sending cooled-off water from the hot-water lines back to the water heater. In addition to having the convenience of near-instantaneous hot water, the system conserves water and uses little energy.

'On demand' recirculation systems are different from ones that are activated by thermostat and/or timer and push cooled-down water back into your water heater for typically 16 to 24 hours a day. These systems that run unnecessarily and make your water heater work much harder, typically costing \$200 to \$600 more in energy costs per year.

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### What are Some Benefits of an 'On Demand' Hot Water Recirculator?

#### Save Time

Stop waiting for hot water. 'On demand' hot water recirculators take about 15-20 seconds for hot water to reach your water fixture after you activate the system. During this time, you can engage in your normal routine, without running the water.

#### Save Water

The amount of water wasted while waiting for hot water depends upon numerous factors – the distance between the point of use and the hot water tank, the hot water temperature setting, the location of the fixture, internal pipe diameter, effective length, insulation level of the pipes, and carefulness of the user – but the Department of Energy estimates that 3,600 to 12,000 gallons of water per year can be saved by the typical household of four with four points of hot water use.

#### Save Municipal Energy Use

When energy used to treat municipal water, pump it to households, and then treat wastewater are factored in, the Department of Energy estimates that energy savings per the same household of four range from 800 to 1,600 kilowatt-hours per year.

**If you are a home-builder** or thinking of having one custom built, this is the perfect time to consider building in a Structured Plumbing system. Structured plumbing is a new design concept that saves energy and water and adds convenience to a home by incorporating an 'on demand' recirculation pump and exact plumbing characteristics to maximize hot water efficiency.

**In order to save additional water and energy**, replace your current showerhead with a new model that uses 1.5 to 2.5 gallons per minute. To see if you'd benefit by replacing your showerhead with a high efficiency model, make a 1-gallon mark on a bucket and hold it under a cold-water shower. If the bucket fills up to the gallon mark in less than 20 seconds, you could save water and energy by switching showerheads, according to the U.S. Department of Energy. Showerheads are inexpensive and new technologies have emerged to get a high flow 'feel' with less water. Also, consider taking shorter showers. A typical shower lasts about 8 minutes and uses about 17 gallons of water. An efficient shower lasts 3 or 4 minutes and uses 7.5 gallons. JCSA may have showerheads and shower timers to share. Check for availability.

**To be even more water savvy**, consider placing a bucket or watering can in the shower while it gets hot or with you to water your houseplants later. At the kitchen or bathroom sink, use the bucket method or plug the sink to avoid constantly running water. At the kitchen sink, detergent cuts the grease. Hot water at the sink does not cut grease and is typically not hot enough to kill germs (149-176°F) so consider saving water, energy for water heating, and time by using cold water to wash items that cannot be washed in the dishwasher. Use the dishwasher as much as possible, since the dishwasher running full loads is more water efficient than all but the most frugal hand washers.

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### Considerations

#### Where to Purchase

Hot water recirculators are commercially available nationwide through plumbing wholesale supply warehouses and at selected retail home stores.

#### Upfront and Operational Costs

'On demand' hot water recirculators typically cost \$200 to \$350 up front and cost only \$27 per year in electricity or \$15 a year in natural gas to operate.

#### Talk to a Professional

We suggest that before installing a hot water recirculator, you consult with a licensed contractor about issues such as plumbing layout, backflow prevention, hard water, and system compatibility, type, and size pump to install.

#### Ease of Implementation

Depending on the situation, hot water recirculators can range from fairly easy to install to more difficult than the average do-it-yourselfer will be able to tackle.

For example, systems with an accessible electric outlet may be easy for a handy homeowner to install. System components are pre-wired. Installation is a simple matter of connecting the water system between the hot and cold water supply, attaching the push button to the low voltage wire provided, and plugging into a 110 Volt outlet. The whole system can be installed in a few hours and does not require major modifications to the plumbing system. Only simple hand tools, such as an adjustable wrench or screwdriver, are needed. However, systems with no nearby electrical outlet may require a licensed contractor.

If you are unsure, we suggest that you contact a licensed contractor.

### What It Is Not

An 'on demand' hot water recirculator is not the same as:

- A tankless water heater,
- A point-of-use water heater,
- A drainwater heat recovery device, or
- A gravity-based hot water recirculation loop.

We do not offer rebates on these technologies due to energy or water use concerns. We will honor rebates for other recirculation pumps such as thermostat- and/or timer-controlled systems as long as they use a comparable amount of energy as 'on demand' systems, as thermostat- and/or timer-controlled systems could increase energy usage.



## "On Demand" Hot Water Recirculator Rebate Form

### Requirements

- Applicant and installation address must be a JCSA residential water customer. Account balance must be current.
- Hot water recirculator rebate request must be submitted and received within 180 days of purchase and installation.
- Generally, 'on demand' systems that are controlled by a button or motion sensor will be rebated. Rebates for other recirculation pumps such as thermostat- and/or timer-controlled systems will be honored as long as they use a comparable amount of energy as on demand' systems, as thermostat- and/or timer-controlled systems could increase energy use.
- Hot water recirculator must be purchased and installed prior to application for rebate.
- Applicant is solely responsible for purchase and installation arrangements and payments.
- Applicant agrees to allow JCSA inspector access to the premises in order to verify installation if selected for random inspection.
- Survey and form must be completed in their entirety and copy of receipt enclosed to be eligible for rebate.
- JCSA will refund up to \$50, not exceeding the cost of one hot water recirculator.
- Rebate checks will be processed within 4-8 weeks of receipt.

### Survey

- Type of structure: ☐ Single-family ☐ Multi-family ☐ Other: \_\_\_\_\_
- What is the main reason for installing your 'on demand' hot water recirculators? ☐ To save municipal energy use  
☐ To save time waiting for water ☐ To save water ☐ Other: \_\_\_\_\_
- Do you plan on installing any other water conservation or low impact development features, such as other WaterSense or Energy Star qualified products, irrigation control technologies, green roofs, rain gardens, porous pavement, or retention ponds?  
☐ Yes ☐ No If yes, what features? \_\_\_\_\_
- Were you previously aware of the availability of residential hot water recirculators? ☐ Yes ☐ No
- How much did this rebate influence your buying decision? ☐ Completely ☐ Somewhat ☐ Not at all
- Date of installation: \_\_\_\_\_ Brand/Model: \_\_\_\_\_
- Type of control? ☐ 'On Demand' ☐ Thermostat ☐ Timer ☐ Both thermostat and timer  
☐ Other: \_\_\_\_\_
- Store/website of purchase: \_\_\_\_\_
- How did you hear about this rebate? \_\_\_\_\_

### Applicant Information

Name: \_\_\_\_\_

Mailing address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Home phone number: \_\_\_\_\_ Email Address: \_\_\_\_\_

Installation address (if different): \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

### Disclaimer

I certify that the listed hot water recirculator has been purchased and installed for use at the above named address and meet the requirements of the James City Service Authority (JCSA) Hot Water Recirculator Rebate Program. I understand that if I am required by my neighborhood to fulfill the actions rebated, then I am not eligible for the rebate. I also acknowledge that my home may be subject to an inspection by the JCSA or its agent to verify the information provided herein.

The JCSA may deny any application that does not meet program requirements. The JCSA does not guarantee any of the benefits in the preceding guide; nor does it warranty freedom from defects, quality of workmanship, or suitability of the premises for the installation of hot water recirculator or associated products. The applicant will hold harmless James City County, JCSA, its agents, directors, officers, and employees against all loss, damage, expense and liability arising out of or in any way connected to the installation of the above hot water recirculator or associated products. The JCSA reserves the right to change or terminate this program at any time.

Please remit completed rebate form and copy of receipt to:  
'On Demand' Hot Water Recirculator Rebate Program  
c/o JCSA  
119 Tewning Road  
Williamsburg, VA 23188-2639  
Fax: 757-229-2463

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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FOR JCSA USE ONLY

Rebate Amount: \_\_\_\_\_

Date Received: \_\_\_\_\_

Date Approved: \_\_\_\_\_

Signature: \_\_\_\_\_

For more information on this and other water conservation rebates, call 757-259-5416,  
Email [jcsa@jamestownva.gov](mailto:jcsa@jamestownva.gov) or go to our website at [jamestownva.gov/jcsa](http://jamestownva.gov/jcsa)

